

ABSTRACT OF THE DISCLOSURE

Methods for producing stress-resistant, antireflective, thin film, sol-derived, optical coatings are provided. The methods comprise providing to a substrate a thin film
5 optical coating including a layer of sol-gel derived cerium oxide and an oxide of silicon, nickel and/or a transition metal selected from Group IIIB through Group VIB of the Periodic Table which is capable of providing a refractive index of at least about 1.90. A multilayer stress-resistant coating is prepared by coating a substrate with an inner layer containing an oxide of titanium and an oxide of silicon, coating the inner layer with a middle layer containing cerium
10 oxide and at least one metal oxide, and coating the middle layer with an outer layer containing an oxide of silicon. Further, a method is provided for producing a thin film optical coating including a layer of sol-gel derived cerium oxide, silicon dioxide, and at least one oxide of a transition metal selected from Group IIIB through Group VIB of the Periodic Table by immersing a substrate in a solution comprising cerium nitrate hexahydrate, an alcohol and a
15 metal compound, withdrawing the substrate from the solution, and heat treating the coated substrate to form the metal oxides. The coatings may be subjected to heat treatments such as tempering or bending and are resistant to cracking and crazing, and thus may be applicable for making articles containing bent glass, such as display cases.